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EXAMINER

FORMAN, BETTY J

ART UNIT

PAPER NUMBER

1634

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,634

Applicant(s)

CHAN ET AL.

Examiner

BJ Forman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 34-48 is/are pending in the application.
- 4a) Of the above claim(s) 35-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 20, 21, 34, 46 and 48 is/are rejected.
- 7) ☒ Claim(s) 2-19 and 47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

KU

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 22 February 2005 in which claims 2-3 were amended and claim 48 was added. The amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 19 August 2004 under 35 U.S.C. 112, second paragraph are withdrawn in view of the amendments. The previous rejections under 35 U.S.C. 102(b) are maintained. Applicant's arguments have been thoroughly reviewed and are discussed below.

Claims 1-21, 34 and 46-48 are under prosecution.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 48 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

New claim 48 contains the recitation "wherein the probe is not a fluorophore".

Applicant points to page 9, line 14 through page 10, line 19 for support of the new claim language. However, this passage nor the remaining text of the specification provides support for this new negative limitation. In contrast, the specification describes what the probe is e.g.

"Suitable probes generally include, without limitation, non-polymeric small molecules, polypeptides or proteins, and oligonucleotides.

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Exemplary non-polymeric small molecules include, without limitation; avidin, peptidomimetic compounds, and vancomycin.”

While the above examples are not fluorophores, the passage specifically teaches these examples are “without limitation”. Therefore, the examples do not define the probes.

Furthermore, the specification does not teach, describe or even suggest what is encompassed by the newly claimed “not a fluorophore”. Hence, the new claim language is deemed new matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 20, 21, 34 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Groger et al (U.S. Patent No. 5,577,137, issued 19 November 1996).

Regarding Claim 1, Groger et al disclose a porous structure comprising a central layer (i.e. waveguide #3) interposed between upper and lower layers having layers of alternating porosity i.e. Bragg reflector (Column 4, lines 33-35 and 40-64) and one or more probes coupled to the porous structure whereby detectable change occurs in a refractive index upon probe binding (Column 2, lines 2-24; Column 5, lines 52-67; Column 8, lines 18-32 and Fig. 9).

It is noted that instant Claim 46 defines the upper and lower layers as Bragg reflectors. Groger et al teach the layers are Bragg reflectors. Therefore, Groger teaches the claimed layers.

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Regarding Claim 20, Groger et al disclose the structure comprising two or more different probes i.e. multiple receptors (Column 4, lines 19-25).

Regarding Claim 21, Groger et al disclose the structure comprising two or more different probes in different zones i.e. multiple receptors in the patterned wave guide (Column 4, lines 19-25; Column 5, lines 3-5 and 52-67).

Regarding Claim 34, Groger et al disclose a detection device comprising the structure of Claim 1, a source of illumination and a detector (Claim 1).

Regarding Claim 46, Groger et al disclose the upper and lower layers are Bragg reflectors (Column 4, lines 33-35).

Response to Arguments

6. Applicant argues that Groger fails to teach a sensor that includes a porous semiconductor as required by the instant claims. The argument has been considered but is not found persuasive because as cited above, the instant specification broadly defines the claimed semiconductor structure as including a Bragg reflector (page 6, lines 10-27).

The porous semiconductor structure includes a central layer (a microcavity) interposed between upper and lower layers, each of the upper and lower layers including strata of alternating porosity. The upper and lower layers form Bragg reflectors.

Semiconductors which can be used to form the porous semiconductor structure can be a single semiconductor material, a combination of semiconductor materials which are unmixed, or a mixture of semiconductor materials. The semiconductor is preferably one which is photoluminescent in its porous state. By virtue of the Bragg reflectors (i.e., the upper and lower layers), the emitted photoluminescence spectrum is composed of multiple sharp and narrow peaks. The light can be in the visible portion of the electromagnetic spectrum (i.e., 350-800 nm), the infrared region (i.e., 800-3000 nm), and the ultraviolet region (i.e., 50-350 nm). These wavelengths are only exemplary and can vary according to the type of semiconductor materials used to form the porous semiconductor structure, the thickness thereof, as well as the porosity thereof (including pore size).

Preferred semiconductors which can be used to form the porous semiconductor structure include, without limitation, silicon and silicon alloys.

The claims require a porous semiconductor structure comprising a central layer interposed between up and lower layer having strata of alternating porosity. As such, the claims define the structure as having layers of alternating porosity. The claims do not require any specific semiconductor materials other than the alternating layers. The specification, as noted above, defines the alternating layers as encompassing a Bragg reflector. Groger teaches a Bragg reflector (Column 4, lines 33-35 and 40-64) and therefore teaches the structure as claimed. While the specification further teaches some preferred materials for the semiconductors, these preferred embodiments are not read into the claims.

Applicant further argues that the sensor of Groger operates by detecting fluorophores while the instantly claimed sensor operates by detecting a change in refractive index. The argument has been considered but is not found persuasive because the intended use of the apparatus does not define the apparatus. The courts have stated that an apparatus must be defined by its structure.

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Because Groger teaches all the structural limitations of the claim, they teach the claimed sensor.

7. Claims 2-19 and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

9. No claim is allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.



BJ Forman, Ph.D.
Primary Examiner
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April 20, 2005